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Notes on *Apanteles* (Hymenoptera: Braconidae) of Taiwan (I)[1]

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Abstract: Twenty-five species of *Apanteles* are reported in this paper. Eight species : *baoris* Wilkinson, *bakeri* Wilkinson, *mamitus* Nixon, *taragamae* Viereck, *galleriae* Wilkinson, *carpatus* (Say), *aristaeus* Nixon and *kariyai* Watanabe are new to Taiwan. A key to the species and the index of host-parasitoid are present.

The genus *Apanteles* are the common parasitoids of a variety of lepidopterous insects and to be considered as the important natural enemies of a number species of crop pests. It is also one of the largest and commonest genus of Braconidae, containing nearly 1,300 known species in the world. So far as I am aware, however, only 17 species of this genus have been known to Taiwan [1,3,7,8,12,14,15,19]. In this paper 8 species are added to the fauna of Taiwan. All the specimens reported in this paper are deposited in the collection of Taiwan Agricultural Research Institute.

Tentative key to the *Apanteles*-species of Taiwan

1. Propodeum with areola and almost always with costula (fig. 2) 2
- Propodeum without areola and costula 16
2. Vannal lobe beyond its widerest part feebly to markedly concave and without projecting hairs (fig. 1) ..... *ater*-group, 3
- Vannal lobe beyond its widerest part evenly convex and with distinct hair-fringe throughout (fig. 3) ..... *ultor*-group, 11
3. Whole body yellow-fulvous. Aberrant species not falling easily into either the *ater* or the *ultor* group. Flagellum long, thick, tapered distally, bristly and with the preapical segment one and a half time longer than wide; mesoscutum highly polished and only indistinctly punctate ; propodeum with complete areolation but the postero-lateral area distinctly transverse ; wings brownish ; metacarp extremely long ; ovipositor sheath as long as the hindtibia ..... *bakeri* Wilkinson
- Whole body black, at most the gaster pale-marked 4
4. Costula virtually absent; ovipositor sheath distinctly longer than the hind tibia ..... *heichinensis* Sonan

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- Costula more or less distinctly defined or at least a distinct keel enclosing the spiracle behind; ovipositor sheath not longer than the hind tibia 5
5. Stigma of both sexes colourless, except along wing edge darker 6
- Stigma of female evenly brown or at most with pale basal spot, of male brown or hyaline 7
6. Tergite I distinctly narrowed behind; gregarious parasitoid ..... *taragamae* Viereck
- Tergite I hardly narrowed behind; solitary parasitoid ..... *bisulcata* Cameron
7. Ovipositor sheath nearly as long as the hind tibia 8
- Ovipositor sheath about three quarters as long as the hind tibia 10
8. Tergite I obviously narrowed behind; costula feebly indicated or absent ..... *galleriae* Wilkinson
- Tergite I not or hardly narrowed behind; costula usually strong 9
9. Postero-lateral area of the propodeum bounded laterally by a fine keel that runs almost parallel with the true lateral margin, these two keels enclose a narrow, longitudinal area (fig. 4); ovipositor sheath narrow, as wide as hind basitarsus in profile; male stigma brown ..... *carpatus* (Say)
- Postero-lateral area of the propodeum without such a keel ; ovipositor sheath wider, markedly wider than hind basitarsus in profile; male stigma pale medially ..... *aristaeus* Nixon
10. Tergite I of both sexes markedly narrowed behind; tergite (2+3) reddish yellow to light brown; male stigma brown ..... *mamitus* Nixon
- Tergite I of female not or hardly narrowed behind, of male more or less narrowed behind; male stigma hyaline; tergite (2+3) blackish ..... *cypris* Nixon
11. Basal field of tergite (2+3) definitely sculptured, rugose or rugulose 12
- Basal field of tergite (2+3) smooth, at most with a trace of minute punctures 14
12. Hind femora yellowish brown; tergite I and basal field of tergite (2+3) entirely with longitudinal striate rugose 13
- Hind femora dark brown; tergite I with a rather smooth median area at the apical half, basal field of tergite (2+3) rugulose ..... *lacteicolor* Viereck
13. Ovipositor sheath hardly shorter than the hind tibia; abdomen wholly black ..... *heterusiae* Wilkinson
- Ovipositor sheath distinctly shorter than the hind tibia; belly reddish yellow ..... *asotae* Watanabe
14. Tergite I with a median longitudinal carina on the apical half; ovipositor sheath as long as the hind basitarsus ..... *sonani* Watanabe
- Tergite I without longitudinal carina; ovipositor sheath longer than hind basitarsus 15
15. Stigma almost pellucid, with darker border; tergite I parallel-sided; hind femora dark brown ..... *baoris* Wilkinson
- Stigma dark brown; tergite I gradually broadened from base to apex; hind femora yellowish brown ..... *taiwanensis* Sonan
16. Propodeum strongly to coarsely rugose; tergite I widened behind, never narrowed, though its apico-lateral corners often weakly, roundly constricted ..... *glomeratus*-group, 17
- Propodeum at most with sparsely punctate; tergite I narrowed behind ..... *vitripennis*-group, 22
17. Thorax dorso-ventrally flattened; head in lateral view unusually prominent below antenna ..... *flavipes* (Cameron)
- Thorax not dorso-ventrally flattened; head not unusually prominent below antenna 18
18. Hind coxa roughened and rugose 19
- Hind coxa smooth, at most closely punctate 20
19. Tergite 3 with a single transverse row of and occasionally some few other fine setae; punctures of scutellum, at least on anterior half, wide enough apart to leave smooth shiny interspaces fully

equal to width of punctures; fore and middle coxae yellowish brown; gregarious parasitoid…… …… *ruficrus* (Haliday)

– Tergite 3, except for small mid-basal area, covered all over with fine setae; scutellum densely rugose-punctate all over, no smooth interspaces anteriorly; fore and middle coxae yellowish brown to black; solitary parasitoid ……*plutellae* Kurdjumov

20. Propodeum with distinct transverse basal carina; hind coxa black ……21

– Propodeum without transverse basal carina; hind coxa reddish yellow……*kariyai* Watanabe

21. Propodeum with a definite, median, longitudinal carina; the hind tibial spurs equal; tergite I in apical half rugose-punctate ; gregarious parasitoid ……*taprobanae* Cameron

– Propodeum without, or hardly a trace of median longitudinal carina ; inner spur of hind tibia distinctly longer than outer one; tergite I in apical half sparsely punctate; solitary parasitoid … …… *theae* Sonan

22. Ovipositor sheath very thick, fully equal to the width of the hind basitarsus in profile; tergite I almost parallel-sided, suddenly narrowed from apical third to apex ……*liparidis* (Bouché)

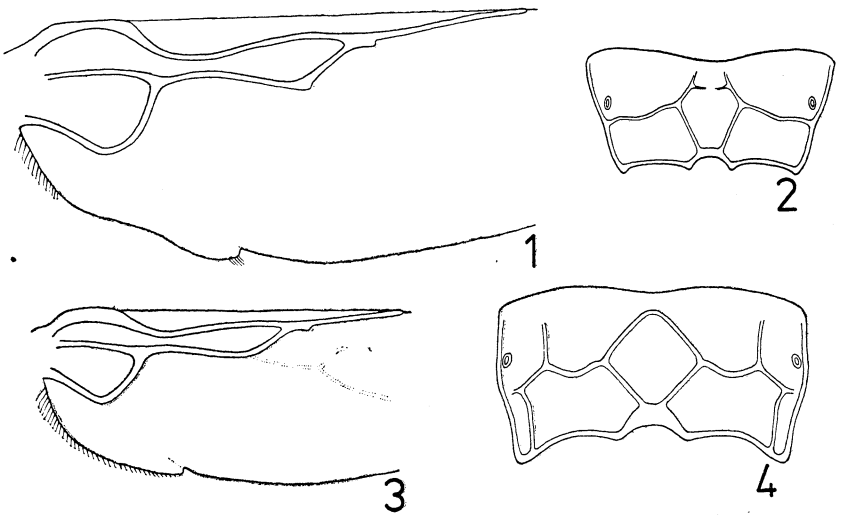
– Ovipositor sheath less thick, not equal to the width of the hind basitarsus in profile; tergite I gradually narrowed from base to apex ……23

23. Tergite 2 with lateral sulci straight; ovipositor sheath half as long as basitarsus …… ……*theivorae* Shenefelt

– Tergite 2 with lateral sulci slightly curved; ovipositor sheath at least two-thrids as long as hind basitarsus ……24

24. Antenna of female in apical 8 segments submoniliform (fig. 6); tergite I with some scatter, minute punctures ……*minor* (Ashmead)

– Antenna of both sexes filiform (fig. 5); tergite I with rather closely punctate, at sides almost rugose ……*lamborni* Wilkinson



Figs. 1-4. *Apanteles*: 1, *heichinensis* Sonan, part of hind wing; 2, *taiwanensis* Sonan, propodeum; 3, *taiwanensis* Sonan, part of hind wing; 4, *carpatus* (Say), propodeum.

ultor-group

Apanteles asotae Watanabe

Apanteles asotae Watanabe 1932 Ins. matsum. 7 : 98.

Specimens examined: Taipei , 46♀, 41♂, 24. XI. 1927 (J. Sonan).

Cocoon: Unknown, presumably gregarious.

Host: *Asota complana* Walk. (Arctiidae)[10].

Distribution: Taiwan.

Apanteles sonani Watanabe

Apanteles sonani Watanabe 1932 Ins. matsum. 7 : 96.

Specimens examined: Taipei , 4 ♀, 8♂, 9. IX. 1926 (J. Sonan).

Cocoon: White, gregarious, cemented together in a large mass, covered with loose silk (fig. 10).

Host: *Chalcosia argentata* Moore (Pyromorphidae)[10].

Distribution: Taiwan.

Apanteles baoris Wilkinson

Apanteles baoris Wilkinson 1930 Bull. ent. Res. 21 : 280. — Nixon 1967 Bull. Br. Mus. nat. Hist. (Ent.) 21 (1) : 22.

This species is new to Taiwan.

Specimens examined : Taipei , 20 ♀, 5 ♂, 27. II. 1969, 5 ♀, 3 ♂, 22. II. 1969 & 12♀, 22. IV. 1969 (K. C. Chou).

Cocoon: White, gregarious, clustered together to form a narrow elongate mass, covered with rather loose silk (fig. 8).

Host : *Parana guttata guttata* Bremer et Grey (Hesperiidae).

Distribution: Philippines, Sabah, Malaya, Sri Lanka, India, Nepal, W. Pakistan, Hong Kong, Taiwan, Mainland China, Japan.

Apanteles taiwanensis Sonan

Apanteles taiwanensis Sonan 1942 Trans. nat. Hist. Soc. Formosa 32 : 246.

Specimens examined: Taipei , 9 ♀, 7 ♂, 1. XII. 1932 (J. Sonan). Tainan, 11 ♀, 31. III. 1977 (L. Y. Chou).

Cocoon: White, gregarious, enveloped within a thin web (fig. 9).

Host: *Porthesia taiwana* Shiraki (Liparidae)[8].

Distribution: Taiwan.

Apanteles lacteicolor Viereck

Apanteles lacteicolor Viereck 1911 Proc. U. S. natn. Mus. 40 : 475. — Sonan 1927 Rep. Govt. Agric. Res. Inst. Taiwan 29 : 46. —Wilkinson 1945 Trans. R. ent. Soc. Lond. 95 (3) : 203. —Nixon 1976 Bull. ent. Res. 65 : 696.

Apanteles conspersae Fiske 1911 *in* Howard & Fiske: Bull. Bur. Ent. U. S. Dep. Agric. 91 : 285. — Watanabe 1934 Ins. matsum. 8 (3) : 141.

Specimens examined: Taipei: Hsintien (=Shinten), 1 ♀, 26. XII. 1920; & Taipei , 1 ♂, 8. IV. 1927 (J. Sonan).

Cocoon : White, gregarious, somewhat woolly, cemented together [12].

Host : *Euproctis pseudoconspersa* Strand (Liparidae) [11].

Distribution : Taiwan, Mainland China, Japan, Afghanistan, Russia, U. S. A., Europe.

Apanteles heterusiae Wilkinson

Apanteles heterusiae Wilkinson 1928 Bull. ent. Res. 19 : 127. — Watanabe 1932 Ins. matsum. 7 : 98. — Nixon 1967 Bull. Br. Mus. nat. Hist. (Ent.) 21 (1) : 25.

Specimens examined : Taipei , 22 ♀, 5 ♂, 7. XI. 1926 & 28 ♀, 8 ♂, 17. II. 1927 (J. Sonan). Taitung: Lanhsu (=Kotosho), 23 ♀, 2 ♂, 17. V. 1943 (H. Aoki).

Cocoon: White, gregarious, irregularly clustered together in a large mass (fig. 15).

Host: *Histia rhodope* Cram. (Zygaenidae) [10].

Distribution: Fiji, Sri Lanka, India, Taiwan, Mainland China.

ater-group

Apanteles bakeri Wilkinson

Apanteles bakeri Wilkinson 1932 Stylops 1 (6) : 143. — Nixon 1965 Bull. Br. Mus. nat. Hist., Ent. Suppl. 2 : 26.

This species is new to Taiwan.

Specimen examined: Taitung: Lanhsu, 1 ♀, 10. III. — 14. IV. (T. Okuni).

Cocoon: Unknown.

Host: Unknown.

Distribution: Philippines, Taiwan.

Apanteles mamitus Nixon

Apanteles mamitus Nixon 1965 Bull. Br. Mus. nat. Hist., Ent. Suppl. 2:45.

This species is new to Taiwan.

Specimens examined: Taipei , 1 ♀, 26. IX. 1975, 1 ♀, 1 ♂, 3. IX. 1976, 1 ♀, 17. VI. 1977, 3 ♀, 1 ♂, 29. VI. 1977 & 11♀, 6♂, 1. VII. 1977 (L. Y. Chou).

Cocoon: White, solitary.

Host: *Hymenia recurvalis* Fab. (Pyralidae).

Distribution: Philippines, Taiwan.

Apanteles cypris Nixon

Apanteles cypris Nixon 1965 Bull. Br. Mus. nat. Hist., Ent. Suppl. 2 : 47. — Watanabe 1967 Mushi 40 (15) : 190.

Specimens examined: Tainan , 2 ♀, 1 ♂, VIII. 1976 (C. H. Wang).

Cocoon: White, solitary.

Host: *Cnaphalocrocis medinalis* Guen. (Pyralidae).

Distribution: Philippines, Sabah, Sarawak, Malaya, Sri Lanka, India, Nepal, W. & E. Pakistan, Hong Kong, Taiwan, Ryukyu Is., Japan.

Apanteles taragamae Viereck

Apanteles taragamae Viereck 1912 Proc. U. S. natn Mus. 42 : 140. — Wilkinson 1929 Bull. ent. Res. 19 : 132. — Nixon 1965 Bull. Br. Mus. nat. Hist., Ent. Suppl. 2 : 66.

This species is new to Taiwan.

Specimens examined: Taipei , 4 ♀, 10 ♂, 29. XI. 1917 (K. Miyake); & 3 ♀, 5 ♂, 23. XI. 1919 (J. Sonan).

Cocoon: White, gregarious, loosely heaped together (fig. 12.).

Host: *Margaronia indica* Saunders (Pyralidae).

Distribution: New Guinea, Java, Philippines, Thailand, Sri Lanka, India, Taiwan, Mainland China.

Apanteles galleriae Wilkinson

Apanteles galleriae Wilkinson 1932 Stylops 1 : 139. — Nixon 1965 Bull. Br. Mus. nat. Hist., Ent. Suppl. 2 : 75.

This species is new to Taiwan.

Specimens examined: Taipei , 1 ♀, 23. III. (F. Ogata); & 13 ♀, 23 ♂, 3. IV. 1978 (W. J. Wu).

Cocoon: White, solitary.

Hosts: *Achroia grisella* Fab. & *Galleria mellonella* (L.) (Pyralidae).

Distribution: India, Taiwan, U. S. A., Argentina, France, Mauritius.

Apanteles carpatus (Say)

Microgaster carpata Say 1836 Boston J. Ent. Hist. 1 (3) : 263.

Apanteles carpatus: Nixon 1965 Bull. Br. Mus. nat. Hist., Ent. Suppl. 2 : 75.

This species is new to Taiwan.

Specimens examined: Taipei , 1♀, 16. VII. 1944 (J. Sonan).

Cocoon: White, solitary.

Host: *Tinea pellionella* L. (Tineidae).

Distribution: Cosmopolitan.

Apanteles bisulcata Cameron

Apanteles bisulcata Cameron 1909 Spolia zeylan. 6 : 43. —Wilkinson 1928 Bull. ent. Res. 19 : 122. — Chiu, Chou & Wu 1978 J. Agric. Res. China 27 (1) : 64.

Specimens examined: Hualien, 18 ♀, 14 ♂, 20. XII. 1977; & Taichung, 1 ♀, 6. I. 1977, 1 ♂, 11. II. 1977, 2 ♀, 3 ♂, 3. IV. 1977, 1 ♀, 4. IV. 1977, 1 ♀, 7 ♂, 9. VII. 1977, 1 ♀, 6. X. 1977 & 2♀, 1♂, 28. X. 1977 (L. Y. Chou). Nantou, 1♂, 22. I. 1977, 2 ♀, 2 ♂, 12. II. 1977 & 3 ♂, 1. V. 1977 (L. Y. Chou) ; & 1 ♂, 16. IV. 1977, 1 ♀, 2 ♂, 21. V. 1977 & 1 ♀, 23. VI. 1977 (W. J. Wu). Chiayi, 1 ♀, 1 ♂, 11. II. 1977, 9 ♀, 8 ♂, 3. III. 1977, 3 ♀, 19. III. 1977, 8 ♀, 4 ♂, 1. IV. 1977, 1 ♀, 7 ♂, 1. V. 1977, 4 ♀, 11 ♂, 8. VII. 1977, 4 ♀, 8. VIII. 1977, 4 ♀, 9 ♂, 6. X. 1977, 4 ♀, 27. X. 1977, 1 ♀, 15. IX. 1977 & 1 ♀, 16. XII. 1977 (L. Y. Chou) ; 4 ♀, 3 ♂, 15. IV. 1977 & 4 ♀, 3 ♂, 20. V. 1977 (W. J. Wu). Tainan, 1 ♂, 22. XI. 1971 (F. C. Yen) ; 6 ♀, 1 ♂, 4. I. 1977, 2 ♀, 20. I. 1977, 6 ♀, 5 ♂, 31. III. 1977, 1 ♀, 14—15. IX. 1977, 1 ♀, 8. XI. 1977 & 12 ♀, 9 ♂, 15. XII. 1977 (L. Y. Chou). Pingtung, 1 ♀, 2 ♂, 8. XI. 1977 (L. Y. Chou).

Cocoon: White, solitary.

Hosts: *Ochyrotica concursa* (Wlsm.), *Pterophorus niveodactylus* (Pgst.) (Pterophoridae)[3].

Distribution: Sri Lanka, Taiwan.

Apanteles aristaeus Nixon

Apanteles aristaeus Nixon 1965 Bull. Br. Mus. nat. Hist., Ent. Suppl. 2 : 95.

This species is new to Taiwan.

Specimens examined: Nantou: Yuchih, 2 ♀, 1 ♂, IX. 1977 & 15 ♀, 9 ♂, VIII. 1978 (T. L. Liao).

Cocoon: Unknown.

Host: *Cydia leucostoma* Meyrick (Olethreutidae).

Distribution: Java, India, Taiwan.

Apanteles heichinensis Sonan

Apanteles heichinensis Sonan 1942 Trans. nat. Hist. Soc. Formosa 32 : 245.

Specimens examined: Hsinchu (=Shinchiku), 1 ♀, 30. V. 1927 (J. Sonan). Taoyuan: Lungtan, 1 ♀, 1♂, XII. 1975 (F. T. Chen).

Cocoon: Unknown.

Host: *Homona coffearia* Nietner (Tortricidae)[8].

Distribution: Taiwan.

glomeratus-group

Apanteles ruficrus (Haliday)

Microgaster ruficrus Haliday 1834 Ent. Mag. 2 : 253.

Apanteles ruficrus : Watanabe 1932 Ins. matsum. 7 : 78. — Chiu & Chou 1976 J. Agric. Res. China 25 (3) : 236.

Apanteles (Protapanteles) narangae Viereck 1913 Proc. U. S. natn. Mus. 43 : 642.

Specimens examined : Taipei , 14 ♀, 4 ♂, 27. XII. 1944 (J. Sonan) ; 41 ♀, 27 ♂, 1. VI. 1971 (K. C. Chou) ; & 3 ♀, 1 ♂, 10. VII. 1976 (L. Y. Chou).

Cocoon: White, gregarious, irregularly clustered together (fig. 11).

Hosts: *Laphygma exigua* Hubner (new host recorded in Taiwan), *Naranga aenescens* Moore, *Spodoptera litura* (Fab.), *Trichoplusia ni* Hubner (Noctuidae)[9].

Distribution: Cosmopolitan of the Old World.

Apanteles plutellae Kurdjumov

Apanteles plutellae Kurdjumov 1912 Russk. ent. Obozr. 12 : 226. — Wilkinson 1939 Bull. ent. Res. 30 : 80. — Watanabe 1963 Ins. matsum. 26 (1): 63. — Wu 1968 J. Taiwan Agric. Res. 17 (2) : 3. — Chiu & Chien 1972 Pl. Prot. Bull. (Taiwan) 14 (4) : 146. — Chiu & Chou 1976 J. Agric. Res. China 25 (3) : 237.

Specimens examined : Taipei : Chingmei, 1 ♀, 1 ♂, 19. II. 1974, 1 ♂, 7. III. 1974, 1 ♂, 15. IV. 1974, 1 ♂, 15. X. 1974 & 1 ♀, 4. XI. 1974; Kungkuan (TARI), 3 ♀, 1 ♂, 11. XI. 1973, 1 ♀, 14. XII. 1973, 1 ♂, 21. XII. 1973, 1 ♀, 14. II. 1974, 1 ♂, 21. III. 1974, 1 ♀, 24. III. 1974, 1 ♂, 20. IV. 1974 & 1 ♀ 20. X. 1974; Yungho, 1 ♀, 4. IX. 1973, 1 ♂, 1. XI. 1973, 1 ♀, 10. XI. 1974, 5 ♀, 1 ♂, 15. XI. 1974 & 3 ♀, 16. XI. 1974; Sanchung, 2 ♀, 15. XI. 1973, 1 ♂, 17. XII. 1973, 1 ♀, 1 ♂, 23. XII. 1973, 1 ♂, 12. II. 1974, 1 ♀, 16. III. 1974 & 1 ♀, 4. X. 1974; Panchiao, 1 ♀, 6. IX. 1973, 1♂, 17. XII. 1973, 1 ♂, 15. I. 1974, 1 ♀, 1 ♂, 19. I. 1974, 1 ♂, 14. II. 1974, 1 ♀, 20. II. 1974, 1 ♂, 9. XI. 1974 & 1 ♀, 11. XI. 1974; & Shulin, 3 ♀, 21. I. 1974, 1 ♀, 7. II. 1974, 1 ♀, 3 ♂, 21. II. 1974, 1 ♀, 3 ♂, 23. II. 1974, 1 ♀, 19. III. 1974, 1 ♀, 21. IV. 1974 & 1♀, 15. V. 1974 (C. C. Liu).

Cocoon: White to yellowish white, solitary.

Hosts: *Spodoptera litura* (Fab.) (Noctuidae), *Plutella xylostella* (L.) (Plutellidae)[1,2,19].

Distribution: New Zealand, Australia, Taiwan, Japan, Russia, Europe.

Apanteles kariyai Watanabe

Apanteles kariyai Watanabe 1937 Ins. matsum. 12 (1) : 41.

This species is new to Taiwan.

Specimens examined: Taipei , 36 ♀, 9 ♂, 10. VII. 1933 (J. Sonan).

Cocoon: White, gregarious, irregularly piled together and enveloped within a woolly white ball

of oval shape (fig. 14).

Host: *Naranga aenescens* Moore (Noctuidae).

Distribution: Taiwan, Mainland China, Japan.

Apanteles taprobanae Cameron

Apanteles taprobanae Cameron 1897 Mem. Proc. Manchr. lit. phil. Soc. 41(4) : 38. — Wilkinson 1928 Bull. ent. Res. 19 : 100. — Watanabe 1932 Ins. matsum. 7 : 83.

Apanteles (Protapanteles) formosae Viereck 1913 Proc. U. S. nat. Mus. 44 : 642.

Specimens examined: Taipei 7 ♀, 12 ♂, 10. XII. 1911 (S. Inamura).

Cocoon: White, gregarious, clustered indiscriminately together.

Host: *Stauropus alternans* Walk. (Notodontidae)[10].

Distribution: Java, Sumatra, Sri Lanka, India, Taiwan, Mainland China, Japan.

Apanteles theae Sonan

Apanteles theae Sonan 1942 Trans. nat. Hist. Soc. Formosa 32 : 218.

Specimens examined: Taipei , 1 ♂, 2. V. 1925 & 7 ♀, 2 ♂, 22. VI. 1927; Taoyuan: Puhsin (=Heichin), 1 ♂, 29. XII. 1933 & 1 ♀, 10. III. 1935 (J. Sonan).

Cocoon: White, solitary.

Host: *Homona coffearia* Nietner (Tortricidae)[7].

Distribution: Taiwan.

Apanteles flavipes (Cameron)

Cotesia flavipes Cameron 1891 Mem. Proc. Manchr lit. phil. Soc. (4) 4 : 185.

Apanteles flavipes: Szépligeti 1904 Genera Insect. 22: 109. — Wilkinson 1928 Bull. ent. Res. 19 : 93. — Watanabe 1932 Ins. Matsum. 7 : 83.

Apanteles (Stenopleura) nonagriae Viereck 1913 Proc. U. S. natn. Mus. 44 : 645.

Apanteles (Stenopleura) simplicis Viereck 1913 Proc. U. S. nath. Mus. 44 : 645.

Specimens examined: Taipei , 14 ♀, 1. VI. 1911 (S. Inamura) & 2 ♀, 1 ♂, 20. XII. 1975 (L. Y. Chou). Tainan , 28 ♀, 18 ♂, 9. VIII. 1931 (S. Takano).

Cocoon: White, gregarious, clustered indiscriminately together, surrounded by some loose silk (fig. 7).

Hosts: *Chilo suppressalis* (Walk.), *Chilotraea infuscatellus* Snellen, *Proceras venosatus*(Walk.), *Tryporyza incertulas* (Walk.) (Pyralidae) ; *Argyroploce schistaceana* Snellen (Olethreutidae) ; *Cirphis loreyi* Dupocchel, *Sesamia inferens* (Walk.) (Noctuidae)[9].

Distribution: Australia, Java, Malaya, Burma, Sri Lanka, India, W. Pakistan, Taiwan, Mainland China, Okinawa, Japan, U. S. A., England, Mauritius, Madagascar.

vitripennis-group

Apanteles liparidis (Bouché)

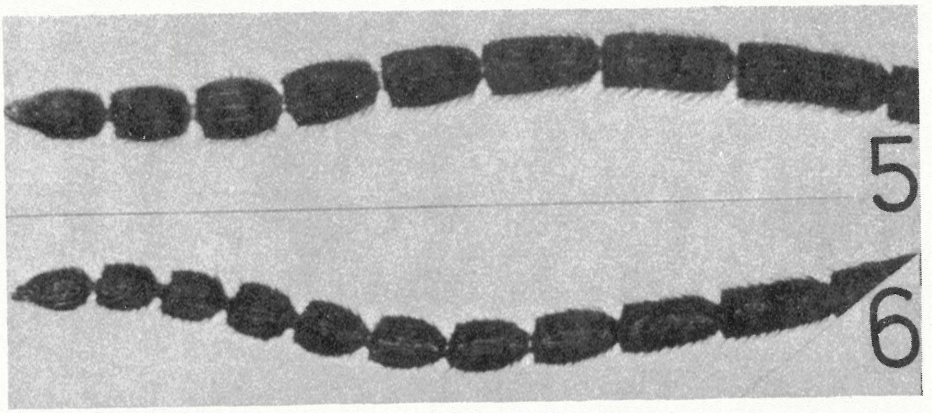
Microgaster liparidis Bouché 1834 Naturg. Insekt. : 152.

Apanteles liparidis: Watanabe 1932 Ins. Matsum. 7 : 89. — Wilkinson 1945 Trans. R. ent. Soc. Lond. 95 (3) : 107. — Nixon 1973 Bull. ent. Res. 63 : 178.

Apanteles posticae Sonan 1927 Rep. Govt. Agric. Res. Inst. Taiwan 29 : 111.

Specimens examined: Taipei , 3 ♀, 4 ♂, 23. V. 1927, 28 ♀, 13 ♂, 1. XII. 1932, 1♀, 11. IV. 1934 & 4 ♀, 2 ♂, 1. V. 1935 (J. Sonan). Tsaoshan, 20 km. N. of Taipei city 3♀, VI. 1970 (K. S. Lin).

Cocoon: White, gregarious, irregularly clustered together (fig. 13).
Hosts: *Notolophus australis* Walk., *Porthesia taiwana* Shiraki (Liparidae)[9].
Distribution: Taiwan, Japan, Korea, U. S. A., N. Africa, Europe.



Figs. 5-6. Apical flagellar segments of female of *Apanteles*: 5, *lamborni* Wilkinson; 6, *minor* (Ashmead).

Apanteles lamborni Wilkinson

Apanteles lamborni Wilkinson 1928 Bull. ent. Res. 19 : 90.
Apanteles lamborini (!): Watanabe 1932 Ins. Matsum. 7 : 91.
Specimens examined : Taipei , 19 ♀, 6 ♂, 28. IV. 1927 (J. Sonan).
Cocoon: White gregarious, clustered indiscriminately together (fig. 16).
Host: *Histia rhodope* Cram. (Pyromorphidae)[10].
Distribution: Malaya, Taiwan.

Apanteles minor (Ashmead)

Glyptapanteles minor Ashmead 1906 Proc. U. S. natn. Mus. 30 : 192.
Apanteles minor: Watanabe 1940 Ins. matsum. 14 : 89. — id. 1957 Ins. matsum. 21 : 3
Specimens examined : Taipei , 17 ♀, 4 ♂, 10. VI. 1936 (J. Sonan).
Cocoon: White, gregarious, irregularly clustered together with some loose silk[12].
Host: *Glyphodes pyloalis* (Walk.) (Pyralidae)[14].
Distribution: Taiwan, Japan.

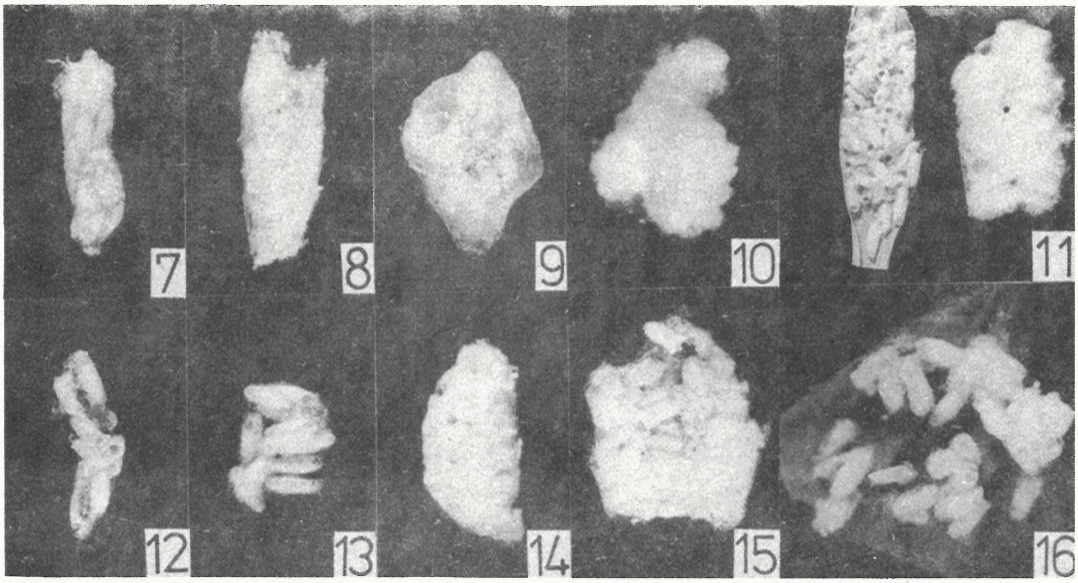
Apanteles theivorae Shenefelt

Apanteles gracilariae Sonan 1942 Trans. nat. Hist. Soc. Formosa 32 : 217.
Apanteles theivorae Shenefelt 1972 Hym. Cat. 7 : 651. replacement name for *gracilariae* Sonan 1942, not Wilkinson 1940.
Specimens examined: Taoyuan: Puhsin, 1♂, 6. I. 1934, 2 ♀, 5 ♂, 10. III. 1935, 1 ♀, 1 ♂, 10. I. 1936 & 3 ♀, 2 ♂, 22. II. 1936 (J. Sonan).

Cocoon: White.

Host: *Gracilaria theivora* Wlsm. (Gracilariidae)[7].

Distribution: Taiwan.



Figs. 7–16. Cocoon-mass of *Apanteles*: 7, *flavipes* (Cameron); 8, *baoris* Wilkinson; 9, *taiwanensis* Sonan; 10, *sonani* Watanaeb; 11, *ruficrus* (Haliday); 12, *taragamae* Viereck; 13, *liparidis* (Bouché); 14, *kariyai* Watanabe; 15, *heterusiae* Wilkinson; 16, *lamborni* Wilkinson.

Host–parasitoid index

Hosts	Species of *Apanteles*
Achroia grisella Fabricius	*galleriae* Wilkinson
Argyroploce schistaceana Snellen	*flavipes* (Cameron)
Asota complana Walker	*asotae* Watanabe
Chalcosia argentata Moore	*sonani* Watanabe
Chilo suppressalis (Walker)	*flavipes* (Cameron)
Chilotraea infuscatellus Snellen	*flavipes* (Cameron)
Cirphis loreyi Dupocchel	*flavipes* (Cameron)
Cnaphalocrocis medinalis Guenee	*cypris* Nixon
Cydia leucostoma Meyrick	*aristaeus* Nixon
Euproctis pseudoconspersa Strand	*lacteicolor* Viereck
Galleria mellonella (Linnaeus)	*galleriae* Wilkinson
Glyphodes pyloalis (Walker)	*minor* (Ashmead)
Gracilaria theivora Walsingham	*theivorae* Shenefelt
Histia rhodope Cramer	*lamborni* Wilkinson
Homona coffearia Nietner	*heichinensis* Sonan
	theae Sonan

Hosts	Species of *Apanteles*
Hymenia recurvalis Fabricius	*mamitus* Nixon
Laphygma exigua Hubner	*ruficrus* (Haliday)
Margaronia indica Saunders	*taragamae* Viereck
Naranga aenescens Moore	*kariyai* Watanabe
	ruficrus (Haliday)
Notolophus australis Walker	*liparidis* (Bouché)
Ochyrotica concursa (Walsingham)	*bisulcata* Cameron
Parana guttata guttata Brem et Grey	*baoris* Wilkinson
Plutella xylostella (Linnaeus)	*plutellae* Kurdjumov
Porthesia taiwana Shiraki	*liparidis* (Bouché)
	taiwanensis Sonan
Proceras venosatus (Walker)	*flavipes* (Cameron)
Pterophorus niveodactylus (Pagenstecher)	*bisulcata* Cameron
Sesamia inferens (Walker)	*flavipes* (Cameron)
Spodoptera litura (Fabricius)	*plutellae* Kurdjumov
	ruficrus (Haliday)
Stauropus alternans Walker	*taprobanae* Cameron
Tinea pellionella Linnaeus	*carpatus* (Say)
Trichoplusia ni Hubner	*ruficrus* (Haliday)
Tryporyza incertulas (Walker)	*flavipes* (Cameron)

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臺灣產之 *Apanteles* 屬小繭蜂(I)[1]

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摘 要

Apanteles 乃小繭蜂科種類最多之一屬，全世界已記錄約 1,300 種。該屬普遍寄生於鱗翅類之幼蟲，爲農林作物害蟲生物防治之重要天敵。本文報導臺灣產之 25 種 *Apanteles*。其中 *baoris* Wilkinson, *bakeri* Wilkinson, *mamitus* Nixon, *taragamae* Viereck, *galleriae* Wilkinson, *carpatus* (Say), *aristaeus* Nixon 及 *kariyai* Watanabe 等 8 種均爲臺灣新記錄 。爲便於鑑定，文中有分種檢索表，繭之形態及寄主昆蟲。文末並附寄主 — 寄生蜂索引 。本文所記錄之標本均存於臺灣省農業試驗所昆蟲標本館。

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